

(19)  **Europäisches Patentamt**
European Patent Office
Office européen des brevets



(11) **EP 1 375 007 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
02.01.2004 Bulletin 2004/01

(51) Int Cl.7: **B05B 1/18, B05B 15/02**

(21) Application number: **02425393.2**

(22) Date of filing: **17.06.2002**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Mazzola, Giovanni Maria**
13018 Valduggia (Vercelli) (IT)

(74) Representative: **Valentini, Giuliano**
Marietti Gislone e Trupiano S.r.l.
Via Larga 16
20122 Milano (IT)

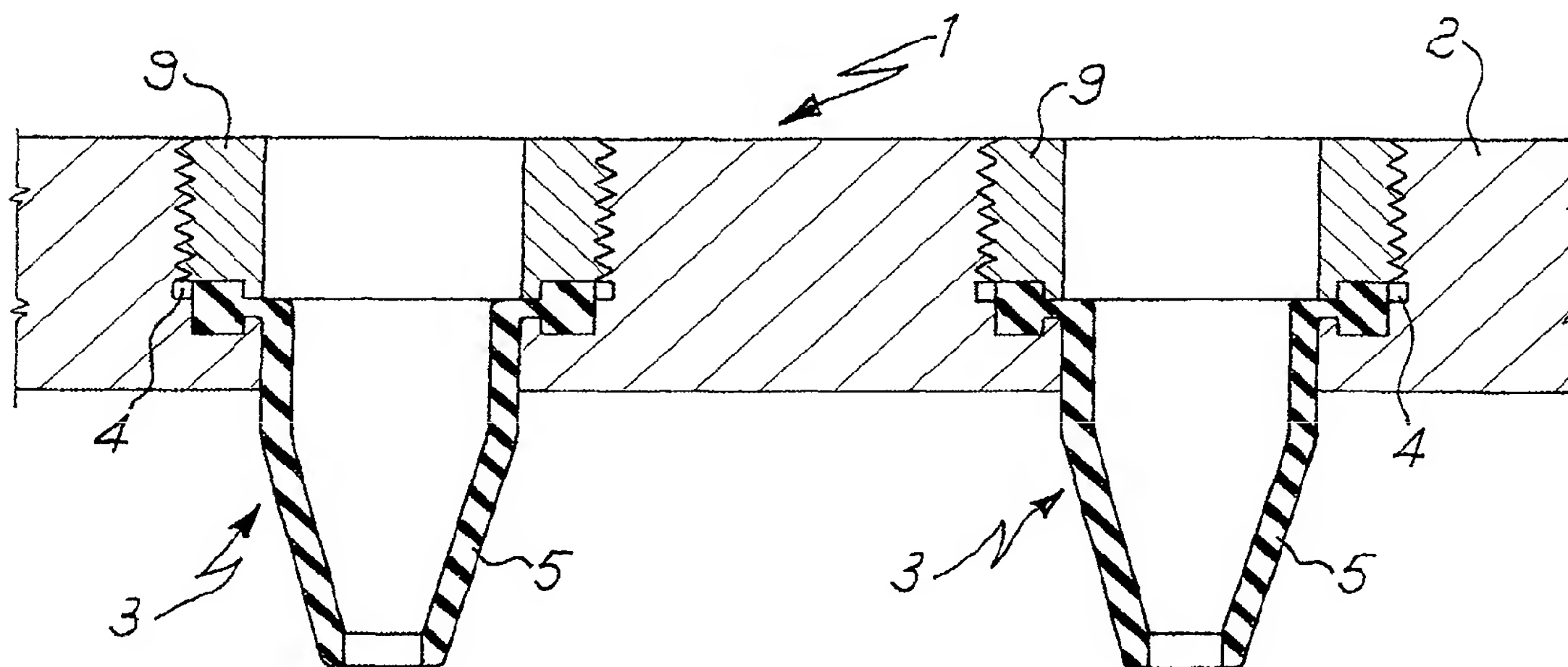
(71) Applicant: **Ergon S.r.l.**
13018 Valduggia (Vercelli) (IT)

(54) **Dispenser assembly for a shower head diffusor**

(57) A delivery assembly (3) for a shower head diffusor (1), of the type comprising fixing means for mount-

ing the assembly (3) on a plate (2) of a shower head diffusor (1). The delivery assembly (3) comprises at least one nozzle (5) made of elastic material.

Fig. 1



Description

[0001] The subject of the present invention is a delivery assembly for a shower head and, in particular, a delivery assembly that can be mounted, in a removable way, on a shower head diffuser.

[0002] One of the most widespread problems as regards diffusers of showers is represented by lime deposit and in particular lime deposited on the outlet holes for the water. With the passage of time these deposits obstruct the outlet holes, so reducing the efficiency of the diffuser.

[0003] In an attempt to solve this problem, diffusers for showers have been proposed, which are equipped with removable metal nozzles, i.e., ones screwed on a plate element of the diffuser itself. In this way, it is possible to remove each nozzle from the plate to clean or replace it.

[0004] Even though the presence of the nozzles guarantees high performance for the diffuser, and the possibility of their removal enables cleaning of the nozzles and/or their replacement to be carried out, whenever necessary, with this type of diffuser it is possible to intervene only *a posteriori*, i.e. when the lime is already deposited.

[0005] Cleaning of the nozzle is, moreover, a laborious operation, which requires time and which is frequently ineffective.

[0006] An object of the present invention is to provide a shower head diffuser which will enable the removal of any lime that may have deposited without removing the nozzles from the plate and which is in any case provided with removable nozzles to enable their replacement.

[0007] Another object of the present invention is to provide nozzles for diffusers of showers, the installation and removal of which is simple and immediately understandable and the unit cost of which is lower than that of nozzles for the said purposes currently present on the market.

[0008] The above and other objects are achieved by the present invention, which concerns a delivery assembly for a shower head diffuser, of the type comprising fixing means for mounting the assembly on a plate of a shower head diffuser, characterised in that said delivery assembly comprises at least one nozzle made of elastic material.

[0009] The elasticity of the material of which the nozzles are made means that they are elastically deformable, just by passing one's hand over them, in order to break up any lime that may have deposited on them in the gaps between the nozzle and the containment seat, so as to detach the deposit and enable its removal without removing the nozzle from the plate.

[0010] According to a preferential aspect of the present invention, the removable nozzles are made of rubber, i.e., of a material, which, by its very nature, has a high elasticity and on which the lime does not stick.

[0011] According to an advantageous feature of the

present invention, the removable nozzle comprises a top flange provided with an outer edge having a thickness greater than the rest of the flange.

[0012] According to another preferential aspect of the present invention, each delivery assembly further comprises a bushing, which is associated to the nozzle and can be inserted at least partially in a through seat made in the plate.

[0013] According to a further advantageous feature of the present invention, the seat and the bushing define a housing for withholding the outer edge of the flange, which can close around the edge itself. In this way, when the bushing and the nozzle are fixed in the seat provided, a grip is obtained around the outer edge, which is of greater thickness, of the flange, which withholds the nozzle securely in position.

[0014] According to an alternative embodiment of the present invention, the delivery assembly further comprises a bushing, which is associated to the nozzle and can be inserted in a through seat made in the plate, and a domed or cap-like element with a hole out of which the nozzle comes for covering at least partially the nozzle and the bushing.

[0015] According to this alternative embodiment, the fixing means comprise one first thread, which is set underneath on the bushing and can be engaged with a corresponding thread made inside the cap-like element and at least one second thread, which is set on top of the bushing and can be engaged with a corresponding thread made inside the seat provided in the plate or in a nut.

[0016] Further characteristics and advantages of the present invention will become more clear from the following description, provided purely by way of illustrative and non-limiting example, with reference to the attached schematic drawings, in which:

- Figure 1 is a partial cross-sectional view of a shower head diffuser provided with two delivery assemblies according to the present invention;
- Figure 2 is an exploded cross-sectional-view of the components of the delivery assembly according to the present invention;
- Figures 3a, 3b, 3c are cross-sectional views of alternative embodiments of the delivery assembly according to the present invention;
- Figures 4a, 4b are cross-sectional views of further alternative embodiments of the delivery assembly according to the present invention, respectively mounted on a plate of small thickness and on a plate of increased thickness;
- Figure 5 is an exploded cross-sectional view of the components of the delivery assembly according to the embodiment illustrated in Figure 4a.

[0017] Figure 1 is a partial cross section of a diffuser 1 for a shower provided with two delivery assemblies 3 according to the present invention mounted in a remov-

able way on the plate 2 of the diffuser. In detail, Figure 1 is a partial illustration of the bottom plate 2 of a diffuser 1, in which there are mounted, in a removable way, and each in an appropriate seat 4, two delivery assemblies 3. Each assembly 3 is provided with a nozzle 5 made of elastic material and with special fixing means for anchoring the assembly 3 to the plate 2. Preferably, the nozzle 5 is made of rubber. Rubber is notoriously a material on which lime does not adhere, and for this reason it is frequently used in fields of application which present the same problems. Each nozzle 5 is inserted from the top down into the through seat 4, made in the plate 2 of the diffuser 1, and is provided at the top, as may be seen more clearly in Figure 2, with a flange 6 having an outer edge 7 with a thickness greater than the rest of the flange 6. The flange 6 of the nozzle 5 resting on the bottom edges 8 of the seat 4, which project radially towards the centre of the seat, withholds the nozzle 5 in the seat 4 whilst the fixing means block the position and ensure tightness thereof.

[0018] The delivery assembly 3 is moreover made up of a bushing 9 of dimensions such as to enable its insertion inside the seat 4 for positioning of the nozzle. The fixing means, which block the bushing in the seat, simultaneously ensure fixing of the nozzle in the seat itself.

[0019] The bottom surface 10 of the bushing 9 and the internal bottom surface of the seat are provided with a profile, which defines a housing 11 for withholding the outer edge 7 of larger thickness of the flange 6 of the nozzle. Consequently, when the delivery assembly made up of the nozzle 5 made of rubber, the bushing 9 and the fixing means is installed in the seat 4 on the plate 2, the bushing 9 and the internal bottom surface of the seat 4, at the edges 8, grip in the housing 11 for withholding the edge of larger thickness 7, further guaranteeing fixing in position of the nozzle 5.

[0020] The bushing 9 is moreover provided, in a position corresponding to its side wall 13, with a thread designed to engage with a corresponding thread made on the internal side wall 14 of the seat 4.

[0021] Furthermore, in order to enable the bushing 9 to be screwed so that it is hidden away inside the seat 4, the latter is provided internally, i.e. in an area corresponding to the pipe 15 for passage of water in the nozzle, with a seat for engagement of an Allen wrench (not illustrated).

[0022] In the alternative embodiment illustrated in Figure 3a, the bushing is not screwed hidden away in the plate 2 of the diffuser 1, but presents, as compared to the latter, when completely screwed in the seat 4, a projecting portion 16. The projecting portion 16 is provided with a hexagonal profile, like a bolt, designed to engage with a wrench for enabling screwing of the bushing 9 inside the seat 4.

[0023] In the alternative embodiment illustrated in Figure 3b instead, the bushing 9 has a longitudinal dimension smaller than the dimensions of the seat 4, and an

elastic means is provided as fixing means.

[0024] In particular, as fixing means a spring washer 17 is provided, which acts radially in compression against the side wall 14 of the seat 4 and which, at the same time, bears upon the bushing 9, so preventing any movement thereof.

[0025] In the embodiment illustrated in Figure 3c, the seat 4 in the plate 2 of the diffuser is made in such a way that the bushing 9 and the nozzle 5 are inserted from underneath. Consequently, the restricting edges 8 of the cross section of the seat 4 are made at the top in the plate 2.

[0026] According to the above embodiment, the bushing 9 has a thread on the external side wall 13, which is designed to engage with a corresponding thread made on the internal peripheral wall 14 of the seat 4, and a portion projecting at the bottom 18 with respect to the plate 2 with an external hexagonal profile like a bolt. In this case, screwing of the bushing 9 in position is from the bottom upwards, carried out, in a known way, using a wrench on the hexagonal projecting portion 18. In this embodiment, moreover, as illustrated in Figure 3c, the bushing 9 has an internal dimension designed to contain the nozzle 5, which comes out of it at the bottom. With this arrangement of the elements making up the delivery assembly 3, the housing 11 for withholding the edge 7 of larger thickness of the flange 6 is made between the internal top surface of the seat 4 and the top surface of the bushing 9.

[0027] Figure 4a illustrates a further alternative embodiment of the delivery assembly 3 according to the present invention. In particular, in this embodiment the delivery assembly 3 is made up of a bushing 9, which is associated to a nozzle 5 made of rubber and can be inserted in the seat 4 of the plate 2 by fixing means and by a domed or cap-shaped element 20. The element 20 is provided, as is illustrated more clearly in Figure 5, with a hole 29 for enabling the nozzle 5 to come out.

[0028] The bushing 9, once again as illustrated in Figures 4a, 4b and 5, has, at the top on the external side wall 13, a thread 24, which is designed to engage with a corresponding thread (not directly illustrated), made on the internal side wall 14 of the seat 4. In the proximity of the bottom end of the bushing 9, but at a sufficient distance therefrom, there is a flange 21, which is in turn provided with a thread 26 that can be engaged with a corresponding thread 27 made on the internal side wall 22 of the cap-like element 20.

[0029] In this embodiment, the nozzle 5 is withheld at the bottom edges 28 of the cap-like element 20, the latter being screwed to the bushing and consequently to the plate 2 of the diffuser. The bushing 9, at the bottom surface of the flange, and the cap-like element 20, at the edges 28 of the hole 29 made for the nozzle 5 to come out, define a housing 23 for withholding the outer edge 7 with larger profile of the flange 6 of the nozzle 5. Furthermore, to achieve better tightness of the delivery assembly 3, provided between the flange 21 of the bushing

9 and the plate 2 is a seal or gasket 30 of a known type, generally referred to as O-ring.

[0030] This embodiment enables adjustment of the diffusers currently used with metal nozzles to the nozzles made of rubber according to the present invention. For this purpose, it is in fact sufficient to unscrew the metal nozzle from its seat provided on the plate 2 of the diffuser and to screw in its place the delivery assembly 3 according to the present invention. In addition, in the case where it is desired to install the nozzle 5 on a plate of a diffuser that is of small thickness, it is sufficient, as illustrated in Figure 4b, to engage the top portion of the bushing 9, i.e. the portion that is obtained - when the delivery assembly is installed - beyond the plate 2 and directed towards the inside of the diffuser, with a threaded nut 31.

Claims

1. A delivery assembly for a shower head diffuser, of the type comprising fixing means for mounting the assembly on a plate of a shower head diffuser, **characterised in that** said delivery assembly comprises at least one nozzle made of elastic material.
2. A delivery assembly according to Claim 1, **characterised in that** said at least one nozzle is made of rubber.
3. A delivery assembly according to Claim 1 or 2, **characterised in that** said nozzle comprises a top flange provided with an outer edge with a thickness greater than the rest of the flange.
4. A delivery assembly according to any of the preceding Claims, **characterised in that** it further comprises a bushing, which is associated to the nozzle and can be inserted at least partially in a seat of a shower head diffuser.
5. A delivery assembly according to any of the preceding Claims, **characterised in that** said fixing means block the bushing and the nozzle, in a removable way, in said seat.
6. A delivery assembly according to Claim 4 or 5, **characterised in that** said seat and said bushing define a housing for withholding said outer edge of the flange.
7. A delivery assembly according to any of Claims 4 to 6, **characterised in that** said fixing means comprise a thread, which is made on said bushing and can be engaged with a corresponding thread made on the inner surface of said seat.
8. A delivery assembly according to any of Claims 4

to 6, **characterised in that** said fixing means comprise elastic means which act radially in the seat for fixing the bushing and the nozzle in said seat.

9. A delivery assembly according to any of Claims 1 to 3, **characterised by** further comprising a bushing which is associated to the nozzle and can be inserted at least partially into one of said through seats made in the plate, and a cap-like element with a hole out of which the nozzle comes for covering at least partially said nozzle and said bushing.
10. A delivery assembly according to Claim 9, **characterised in that** said bushing and said cap-like element define a housing for withholding said outer edge of the flange.
11. A delivery assembly according to Claim 9 or 10, **characterised in that** said fixing means comprise a first thread, which is set underneath on the bushing and can be engaged with a corresponding thread made inside the cap-like element, and at least one second thread, which is set on top of the bushing and can be engaged with a corresponding thread made inside the seat provided in a shower head diffuser and/or in a nut.
12. A diffuser for a shower provided with a plate and with one or more through seats, **characterised by** comprising one or more delivery assemblies according to any of the preceding Claims which are individually mounted in a removable way each in one of said seats.

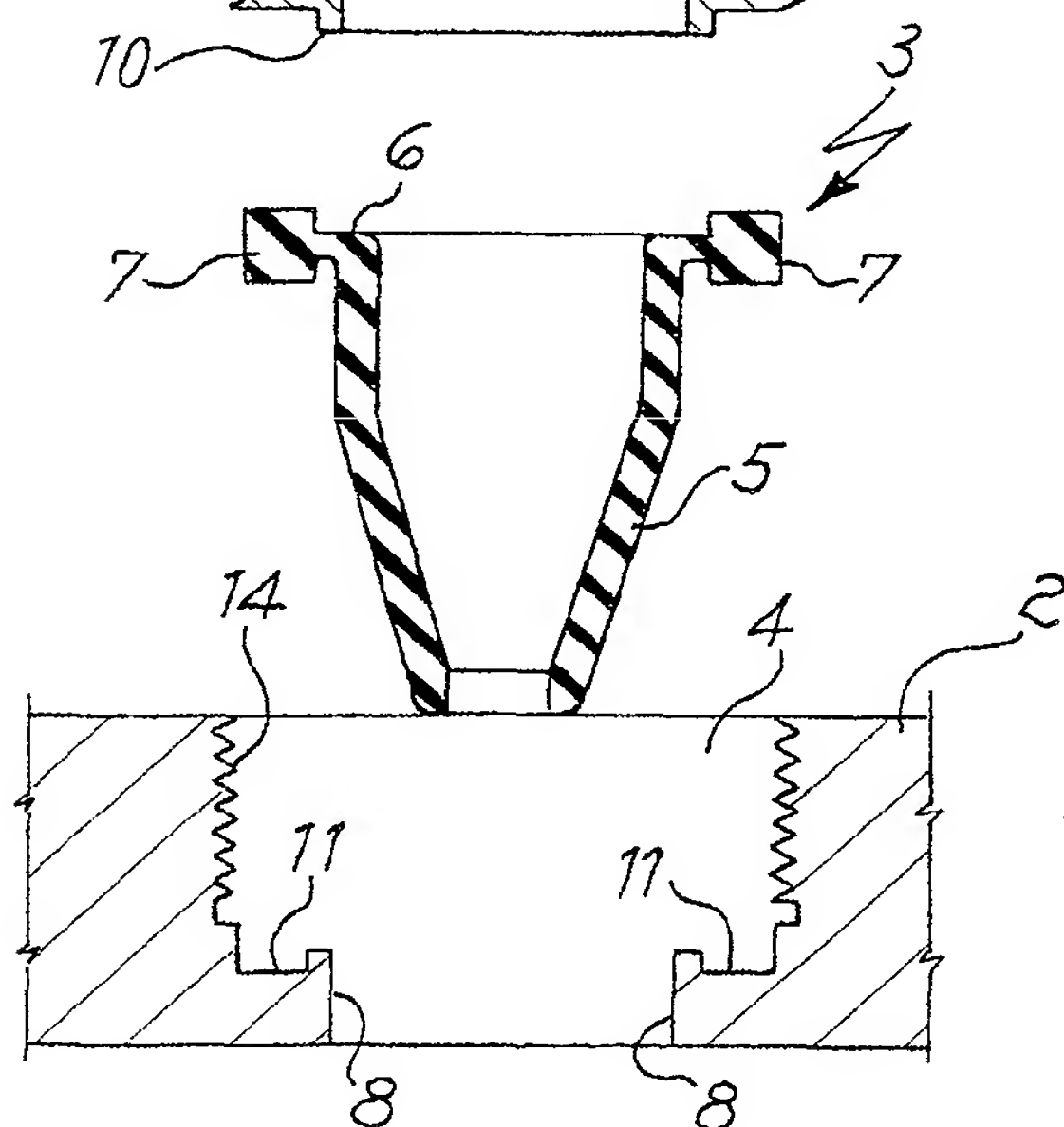
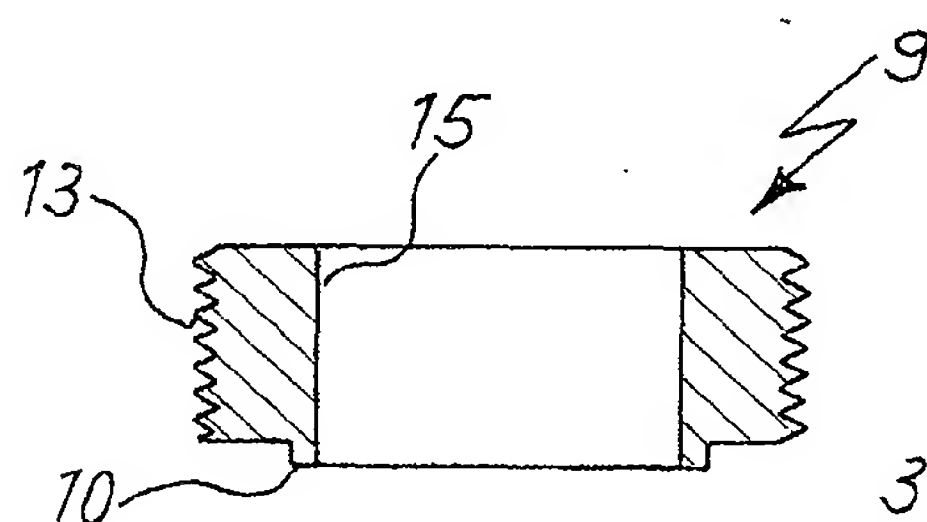
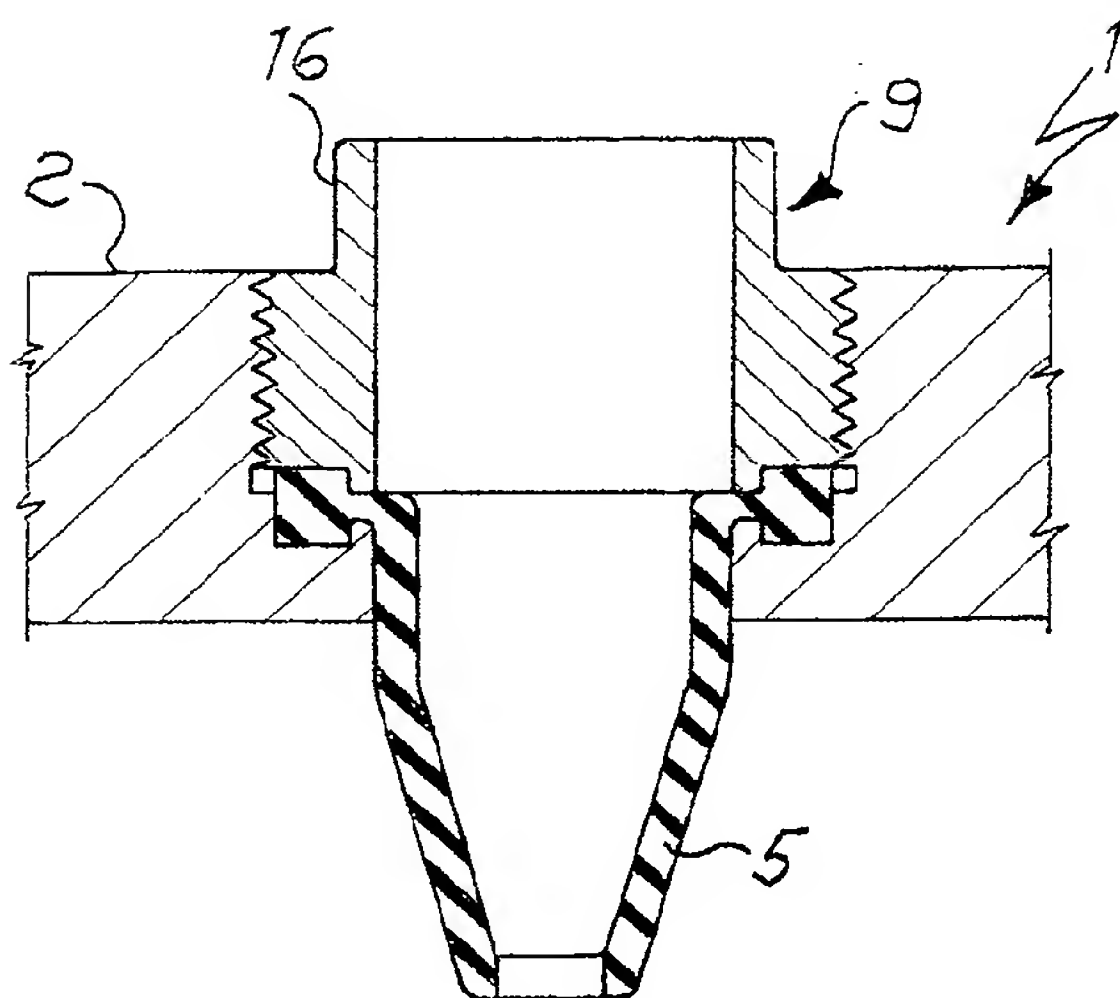
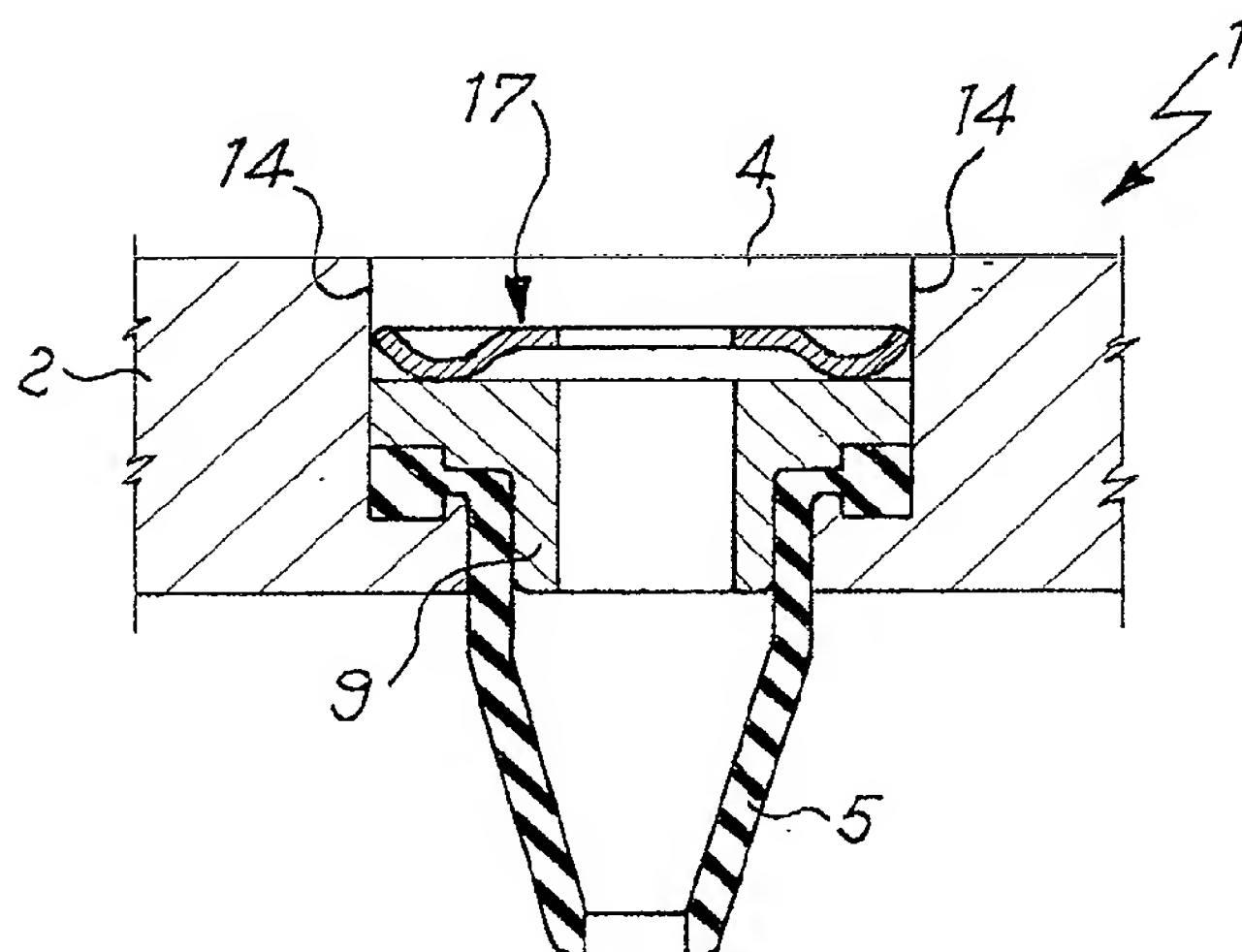
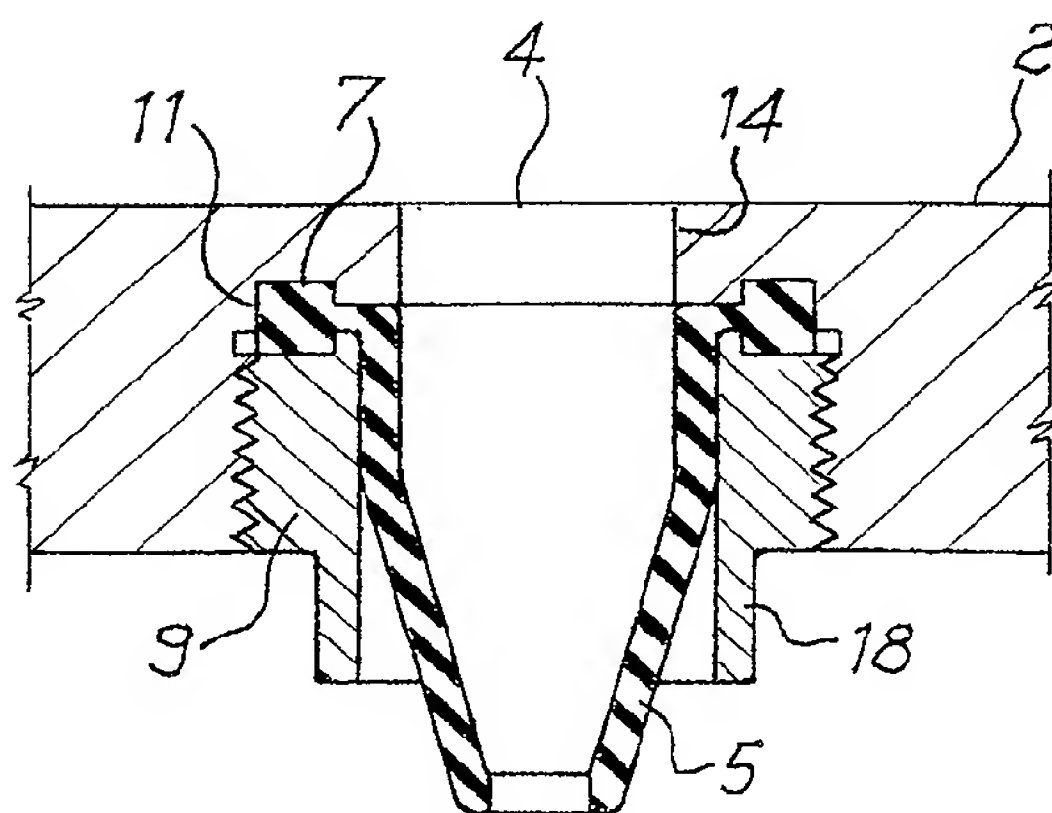
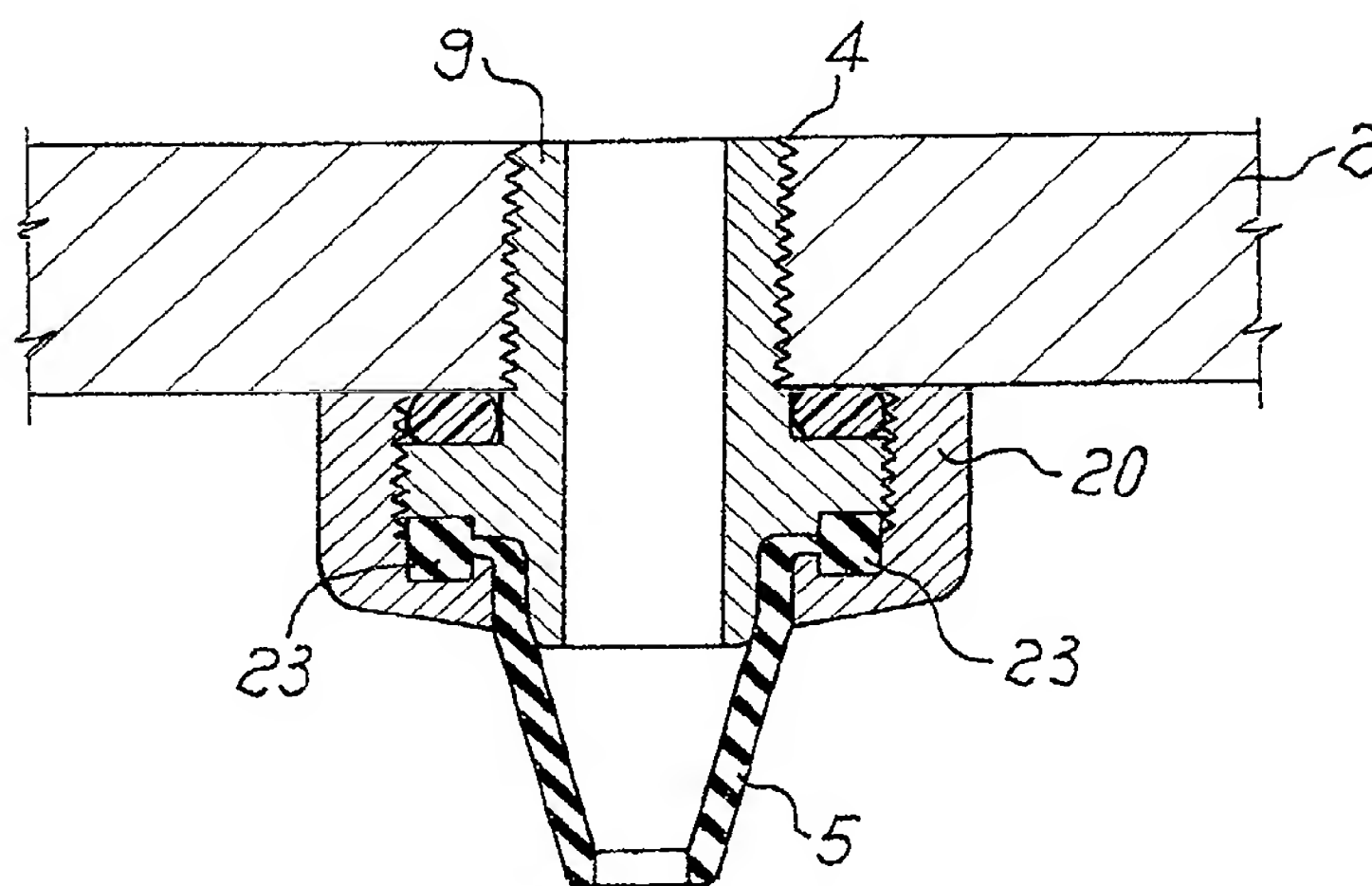
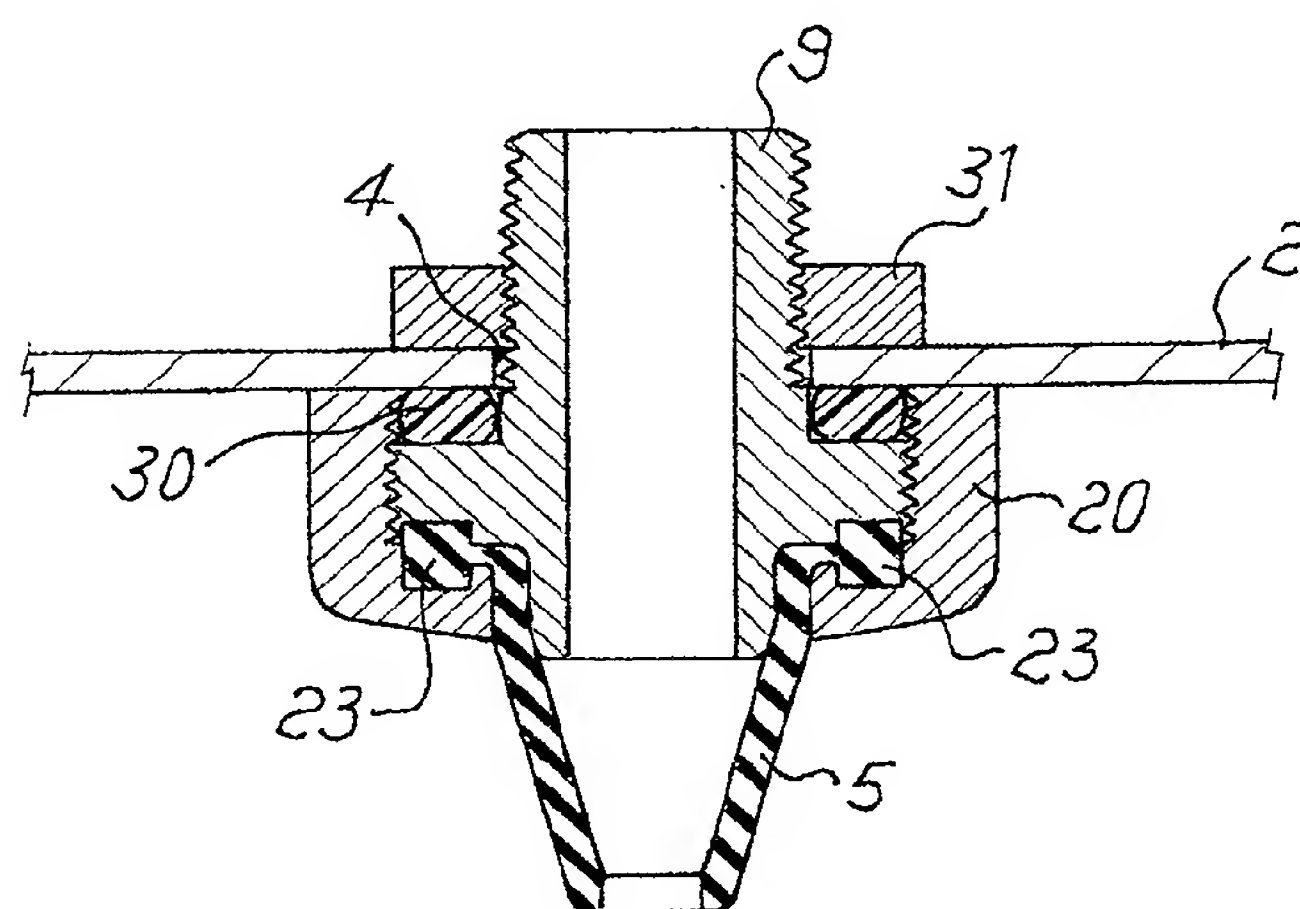


Fig. 2

EP 1 375 007 A1

Fig. 3aFig. 3bFig. 3c

EP 1 375 007 A1

Fig. 4aFig. 4b

A cross-sectional view of a device. It features a central rectangular cavity (4) flanked by two side regions (14). The side regions are filled with diagonal hatching. The entire structure is bounded by a top surface (2) and a bottom surface (1). The left and right vertical boundaries are indicated by wavy lines.

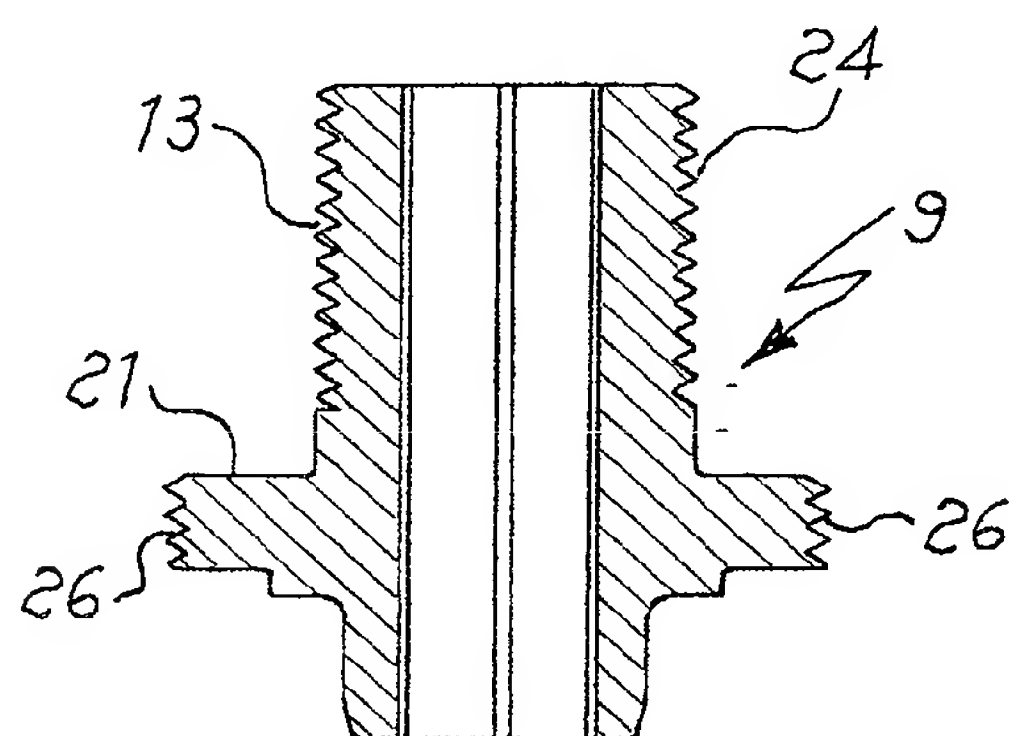
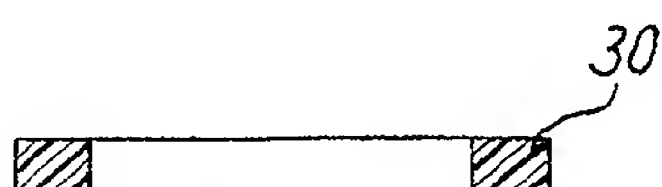
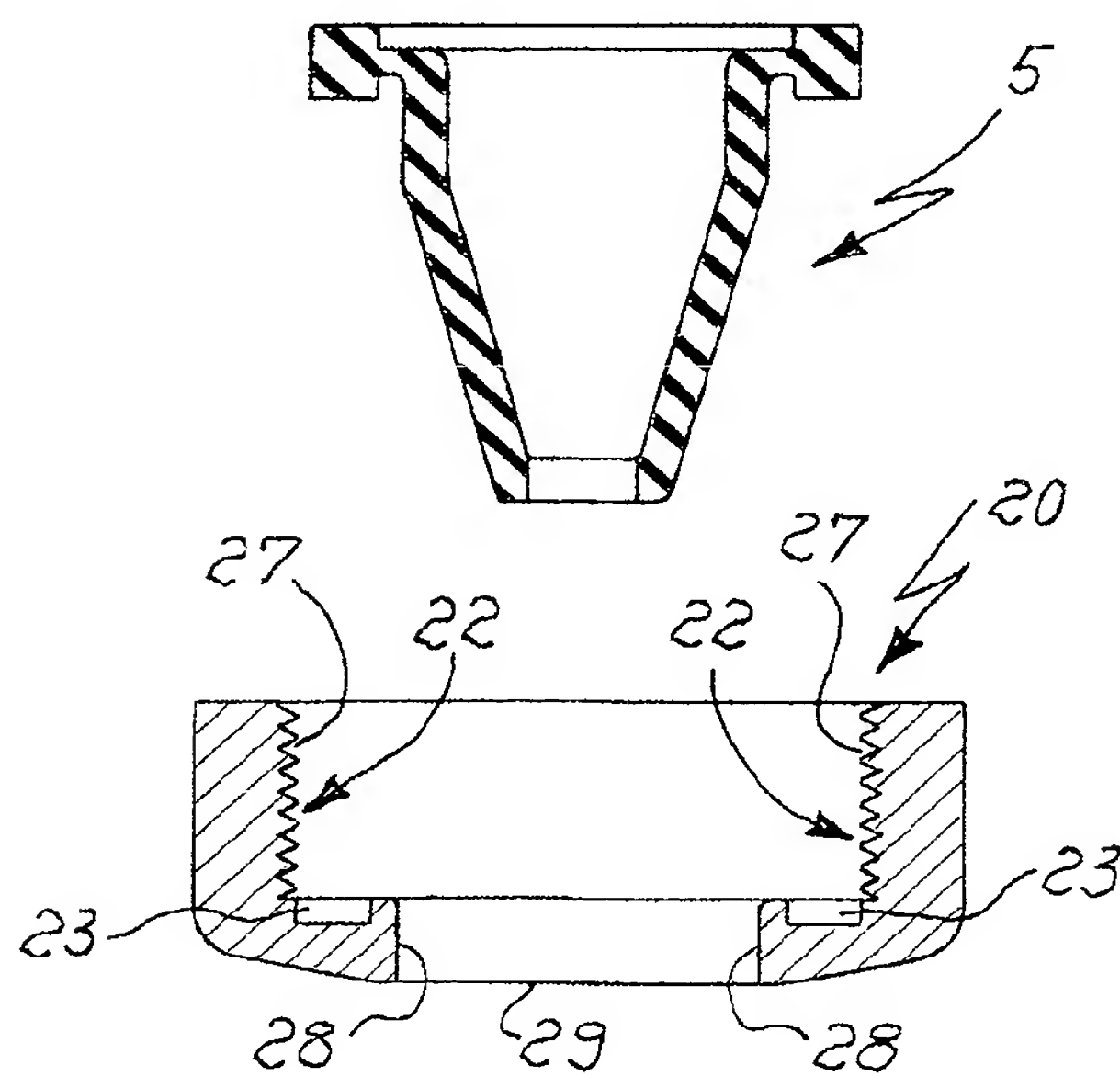


Fig. 5



EP 1 375 007 A1



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 42 5393

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 6 250 572 B1 (CHEN JACKSON) 26 June 2001 (2001-06-26) * abstract *	1,2	B05B1/18 B05B15/02
X	US 5 172 862 A (HEIMANN BRUNO ET AL) 22 December 1992 (1992-12-22) * column 3, line 30 - line 35; figure 4 *	1,2	
X	US 5 228 625 A (GRASSBERGER ROLAND) 20 July 1993 (1993-07-20) * column 5, line 31 - line 39; figure 1 *	1,2	
A		3-7,12	
X	GB 2 311 474 A (CARADON MIRA LTD) 1 October 1997 (1997-10-01) * page 5, line 23 - page 6, line 2 *	1,2	
A		3-6,8,12	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B05B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 20 November 2002	Examiner Juguet, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04Cor1)

EP 1 375 007 A1

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 02 42 5393

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

20-11-2002

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 6250572	B1	26-06-2001	NONE		
US 5172862	A	22-12-1992	DE	3943062 A1	04-07-1991
			AT	101062 T	15-02-1994
			DE	9017969 U1	03-06-1993
			DE	9017978 U1	03-06-1993
			DE	59004515 D1	17-03-1994
			DK	435031 T3	02-05-1994
			EP	0435031 A2	03-07-1991
			ES	1018684 U1	01-02-1992
			ES	2050921 T3	01-06-1994
			JP	3202164 A	03-09-1991
			JP	3206918 B2	10-09-2001
			RU	2031736 C1	27-03-1995
US 5228625	A	20-07-1993	CA	2053228 A1	23-08-1991
			DE	4105183 A1	29-08-1991
			WO	9112894 A1	05-09-1991
			DK	443538 T3	22-11-1993
			EP	0443538 A1	28-08-1991
GB 2311474	A	01-10-1997	NONE		

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82